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## **EXHIBIT 22**

Central Valley Regional Water Board  
MINUTES OF BOARD MEETING  
April 5, 2018

Karl Longley: Good morning ladies and gentlemen, welcome to the 556th Board Meeting of the California Regional Water Quality Control Board, Central Valley Region ...

[Start Recording at 0:22:33.7]

Longley: Valley Water McKittrick Facility, in Kern County is the topic of Agenda Item 13. This is the time and place for a hearing to consider adoption of a resolution directing staff to prepare an order excuse me, adoption of a resolution directing staff for to prepare an order for Valley Water Management Company of Kern County. Is there anyone present who is contesting the proposed action or wishes to present evidence or testimony on this matter? [talking] Since there are persons present wishing to contest this Item, we will proceed with a hearing.

This hearing will be conducted in accordance with the Notice of Public Hearing and meeting procedures published with the meeting Agenda. At this time evidence should be introduced on whether the proposed action should be taken. All persons expecting to testify, please stand at this time, raise your right hand and take the following oath, do you swear the testimony you are about to give is the truth? If so, answer I do.

Crowd: I do.

Longley: Thank you very much. The designated party is Valley Water Management Company, the total time allowed for testimony is as follows: Valley Water Management 10 minutes, all other persons or interested persons shall limit their testimony to 3 minutes, and a timer will be used. The timer is over here to my right on the wall. When you testify, please state your name, address, affiliation and whether you have taken the oath. Does counsel have any legal issue to discuss at this time?

Stephanie Yu: Not at this time.

Longley: Thank you. We will now begin with staff presentation.

Dale Harvey: Chairman Longley, Dale Harvey, supervising engineer out of the Fresno office. Our lead presenter seems to be absent, so if I could have a few minutes to track them down, that would be helpful.

Voice: [whispers] It's Clay.

Langley: Oh, Clay? I think he got called out for some other business.

Harvey: Yeah, we were assuming there would be at least one item before this one.

Longley: Yeah, I understand, it went very fast this morning. We're going to, that's not an issue. We'll take a short recess until you can find the Executive Officer.

Harvey: Thank you. [0:25:12.1]

[Meeting recording resumes at 0:29:14.3]

Longley: Mr. Rodgers, are you prepared?

Rodgers: I am Dr. Longley, except I need to take the oath because I was out of the room.

Longley: Do you swear the testimony you are about to give is the truth if so, answer I do.

Rodgers: I do.

Longley: Go ahead please.

Rodgers: Good afternoon Chair Longley, and members of meeting.

Longley: Good morning maybe.

Rodgers: It is good morning, I was anticipating afternoon incorrectly. Good morning Chair Longley and members of the Board. My name is Clay Rodgers, the assistant Executive Officer in your Fresno office and I have now taken the oath.

The Item for your consideration today is a resolution for the McKittrick 1 and 1-3 oil field produced water ponds facility operated by Valley Water Management Company. The resolution is intended to provide staff direction for how to manage and regulate this and similarly situated facilities going forward. Monitoring and Reporting Program R52018 808 was signed yesterday by the Executive Officer and I will just talk briefly about the MRP later in the presentation.

First, I want to lay out why we are here and the issues that brought us to a hearing and the resolution. Then I will use the McKittrick 1 and 1-3 facility to explain the situation and the options for regulating this and similarly situated facilities. I will finish with options, and then Dale Harvey will talk about responses to comments and changes to the documents, and Patrick Pulupa will present the conclusions and the recommendations.

This hearing is occurring because I issued a Monitoring and Reporting Program, or MRP, acting on behalf of the Executive Officer in late June of 2017. That MRP would have dramatically increased Valley Water's monitoring requirements. Valley Water petitioned the order and requested that the order be rescinded in early-July 2017, and asked that it be brought to the Board for hearing for consideration. The order was rescinded and it was decided that we should continue discussions with the discharger. As I've already explained, we have come to resolution regarding the Monitoring and Reporting Program and it was signed yesterday. However, we continue to have discussions and disagreement with the discharger regarding how the Board should proceed in determining the appropriate permit to regulate this facility because of its unique subsurface conditions that I will discuss later in the presentation.

At the request of the Executive Officer, we are presenting a summary of the issues facing staff and the discharger to ask the Board to give staff direction on our path forward to regulate this site and other similarly situated sites.



The discharger's issues with the original MRP included the extent of monitoring being ordered and the extent of findings in the MRP itself. These issues have been largely resolved with the discharger, and as I said, the revised MRP was signed yesterday. It has been provided to you and uploaded to the website, and the discharger is aware of this situation.

The resolution that is before you now is designed to seek Board input on how to regulate this and similar facilities with oil field produced water ponds when the discharge from the pond is too poor a quality groundwater that may not support beneficial uses, but can migrate to higher quality groundwater not suitable for de-designation of those beneficial uses. The question is how these facilities should be regulated with the available options being the oil field General Orders Nos. 1, 2 and 3, or an individual Order. As a short refresher on the oil field produced water ponds Orders, that was adopted by this Board in April of last year to regulate oil field produced water discharges to ponds.

Order No. 1 is for circumstances where the discharge is of good quality and that does not apply to this facility and is not a question for today. Order No. 2 is for circumstances where poor quality water is discharged over good quality water that supports beneficial uses and the conditions and what's needed in order to regulate that.

Order No. 3 is where the underlying ground water quality is poor, does not support the beneficial uses, and appears to be appropriate for de-designation. This Order would allow for poorer quality, poorer water quality discharges be authorized and provides a 5-year time schedule to have the beneficial uses de-designated in the Basin Plan. Where the use of the General Order is not applicable for a particular discharge, the Board would need to adopt an individual order to authorize the discharge.

I will begin the discussion of the McKittrick 1 and 1-3 facility by talking about the setting. The site is located in Kern County on the western edge of the San Joaquin Valley and shown in the labeled white box on the left hand side of the aerial photograph shown here. The facility is west of the California Aqueduct, and Interstate 5 freeway, and a little over 8.7 miles west of the community of Buttonwillow that is in the white box on the right side of the photograph.

I've included the Clean Harbors Hazardous Waste Landfill a little less than 2 miles to the northeast of the Valley Water site because there is an active monitoring system at this facility and some of the wells for this facility are shown on a later figure. This aerial photograph is a little closer than the previous one and shows the McKittrick and Clean Harbors facilities and the proximity to active oil production areas of the South Belridge Monument Junction and Cymric oil fields. This also shows agricultural fields that are on the northern half of the photo, including a couple of fields within the South Belridge Oil Field. Also prominent is the ephemeral drainage that is on the north side of the McKittrick and Clean Harbors facilities and flows to the northeast into the valley. The natural area between the McKittrick and Clean Harbors facilities has proven difficult to access by drill rigs because of endangered species being present.

This is an aerial photograph of just the facility. According to Valley Water discharge to the interconnected pond system is through pipelines and is first discharged into a series of cleaning ponds. There are 9 cleaning ponds where oil is skimmed off the surface and removed by vacuum trucks. There are 31 what are called pass-through ponds where the waste water flows from the

cleaning ponds with flow regulated using valves on each of these ponds. Wastewater then flows from the pass-through ponds and into 43 percolation ponds. The McKittrick 1 and 1-3 ponds are interconnected and therefore regulated as one facility. None of the 83 ponds are lined and discharge from the facility, aside from the oil removed by the vacuum trucks, is through percolation and evaporation.

This chart shows the range of concentrations for select constituents detected in discharge samples collected from 1988 through the middle of last year. Sample results are from monitoring performed by Valley Water and also from samples collected by Board staff during inspections. The primary point to make from this slide is that the water being discharged is very poor quality, and hence, the determination that General Order No. 1 is not appropriate. The bottom line of the table is flow. We have monitoring reports since 2010 that show that flows have ranged from 105,000 to 42,000 barrels per day with an average of a little over 62,000. For reference, a barrel is 42 gallons of water, so we're looking at an average of about 2.6 million gallons of very poor water quality discharged daily as an average.

Both Valley Water and the Clean Harbors facilities have conducted hydrogeologic studies and installed groundwater monitoring networks. The blue symbols and the one red symbol mark the location of Valley Water's monitoring wells, and the green symbols mark the locations of selected Clean Harbors' monitoring wells. In June 2010, Valley Water began regularly monitoring its discharge and enhanced the groundwater monitoring down structure and down gradient of the McKittrick facility that is to the north, basically in the northeast direction. Clean Harbors has been monitoring much longer in compliance with hazardous waste facility regulations on the books since 1984. The white line A to A prime represents a cross-section presented that I'll go to now.

This cross-section shows very simplified geology beneath the area and it runs from the southwest at A to the northeast at A prime. This is unedited from Valley Water's recent monitoring report and the date of the figure is February of 2018. The vertical lines are monitoring wells with VWMC designating Valley Water wells and the MW designating Clean Harbors' wells. The ponds are on the left hand side of the figure. The blue in this representation is their representation of water from the ponds and basically accumulating as groundwater.

Longley: This figure is kind of hard to, is very hard in fact to see, even close-up on a monitor.

Rodgers: Yeah, I apologize for that, Dr. Longley, it was about as good as we could get. We might be able to darken the lights a little bit? I mean I can actually walk over to the....

Longley: That might help with...

Rodgers: To the screen and kind of wave a little bit if that would, if that would help.

Longley: Unless you have a pointer, one of the laser pointer

Rodgers: Well, the laser pointer is pretty small. So I'll go truly into lecture mode. I'll truly go into lecture mode, which I'm sure you can appreciate. I'll try to stand off to the side so everybody can see. This is a cross-section. So this point A here, is basically at the southwest



end and starts basically at the... yeah, it's really light blue. But this is the Valley Water facility and basically down here, this is the Clean Harbors facility off to the northeast. What we see here are a series of wells, these are Clean Harbors' wells. These are Valley Water wells, and I will add this, right in here, but off the direction and cross-section there is a deeper well that we have into what is called the Regional Aquifer. So you can't see this very well, but along this line here is the Regional Aquifer. Valley Water has basically tied into monitoring done down there at Clean Harbors and it's kind of estimated to be where it is off to the east. And then we have a couple of clay zones that may act as barriers to groundwater flow. This is the CCE clay, that's short for the Corcoran Clay Equivalent, but it is not the Corcoran Clay that separates the shallow material with alluvial it recently deposited from the Tulare Formation. And then we have what's called the Upper Tulare Clay that is within the clay. These clays may actually work to restrict the vertical flow of fluids, so what's depicted here is that this plume is infiltrating from the ponds and they show what they've called Perched Produced Water migrating along this, just past this well, 17K1. And there is a question mark there on their figure because the reality is we don't know where the front of that water is. Valley Water has depicted it to be very close to that well. This well used to be dry, it's got over 50ft of water in it now. So groundwater levels have come up dramatically. I think it's this well or one of the wells nearby. The wells are a little bit different, and we'll talk about a groundwater contra-slope, but things slope off to the east. And you've got the Central Valley out here, you've got water supply wells and whatnot, that part of the concern is that we could hit the slope down here and get drainage of this water into the valley and a down gradient direction. I'll also add that we'll talk a little bit about the groundwater contra-slope slide that's next, but this slope is pretty steep. That's a really steep gradient and that controls the rate at which groundwater flows is very dependent upon the slope of that surface because the steeper it is, just like a creek, the faster it flows. So, the rate at which this is flowing is a little bit of a question mark. And then the question is about the regional, the Regional Aquifer, and I'll talk about that in a little bit. Most of Valley Water's wells are what they call this Upper Tulare sand, and then we have the Regional Aquifer, and I'll move on.

Longley: Thank you, I think that puts, your presentation over there was worthwhile. Thank you.

Rodgers: You're welcome. This slide is the groundwater contour method I mentioned from a recent Valley Water Monitoring Report. The contours on this, or what was on this section, is that produced water perch zone. On the previous slide, and is the water bearing zone where most of Valley Water's monitoring wells are completed. The contour interval on this slide is 25ft. So, it's actually very steep compared to what we normally see in the Valley. And flow is toward the northeast. Now, I added a black arrow there, that black arrow that's on the north side is basically the general direction of groundwater flow and I added that to the figure, that was not originally on Valley Water's figures.

Next, I'm going to talk about groundwater elevations just a little bit, and this is for 4 of the wells at the Valley Water's site, 19H1, 17N1, 17K1 and 21D1. The general thing to see here is the groundwater elevations have increased. The increase in groundwater elevation appears to be representative of the mound from percolation of wastewater with no other apparent source for the water in the general area, and this basically hasn't been a point of contention between Valley Water's consultants and Regional Board staff. We also have seen small increases in groundwater in the deeper monitoring well, which is the 21D1, and is shown by the red symbol

on this map. And I should add that there's little blue lines that tie the well to the chart so that you know which chart goes with which well.

There are complexities with recent trends and additional data are needed to fully understand what is going on, supporting why we needed and enhanced monitoring and reporting program and updated.

I'll talk a little bit about concentration trends. This well, 21D1, shows groundwater samples collected over time since 2002 to 2017, and is in the deep well, 21D1, and shows basically that groundwater concentrations for total dissolved solids, chloride, and boron have increased dramatically. And they still continue to be on an upward slope, and this is the well that was completed into the Regional Aquifer that's connected to large water supply wells that are off to the east. We'll talk about what this means, but staff concerns is that there is potential connection with usable water supplies and that putting water of this quality into the Regional Aquifer is a significant issue. The information sheet in your packet goes into much more detail on the water quality associated with this.

So, now I'm going to talk just a little bit about options to regulate.

Longley: Mr. Rodgers, before you go there.

Rodgers: Yes, sir.

Longley: Do you have a graph or information of flow rates, maybe average annual flow rates over a period of time?

Rodgers: If we go back, I do not have the chart that is basically a histogram of the flow rates. Like I said, I may have that. Is that his slides on the bottom of this presentation when I get to the end I'll be happy to look at that and see if it's in this particular presentation.

Longley: In general can you describe the history of flow from this facility.

Rodgers: Well, for as much data as we have, flows have been as high as reported to us, as 115,000 barrels a day. I think what I testified to earlier when we had flows since 2010, that that was 105,000 and 42,000 and that's what is reported to us by the discharger.

Longley: Do we have any data in the 1990s?

Rodgers: We do not.

Longley: Okay.

Rodgers: I mean unfortunately...

Ramirez: And how long have they been operating this site?

Rodgers: Dale might be able to help me, but I want to say since 1950s or 60s?



Harvey: Yeah, I believe the site started operating as early as, maybe even before 1950. We do have some data from the 90s, but most of the data that we do have we gathered when staff went out to the site and asked the discharger or their workers how much flow is coming in. So it's somebody basically relaying to us a number and the average that Clay has on his slide is actually I believe an average from 1996 to 2017, so its...

Rodgers: No, that was the average from 2010, the average for the data we have since 1996, was actually about 68,000 barrels a day instead of 62,000, but we averaged the numbers that we talked about.

Ramirez: Thank you.

Rodgers: So, I go back to..., I believe we were on this slide; no, we were back to Options to Regulate, excuse me. So, the issue becomes how do we regulate the McKittrick 1 and 1-3 facility? So first, let me talk a little bit more about the General Orders so you understand what's available to us. And this slide compares General Order No. 2 and General Order No. 3. The diagram on the right is for General Order No. 3. It is designed for facilities that overlie poor quality groundwater that is identified as the brown aquifer at the bottom of the slide or the bottom of that figure. The Order provides the opportunity for the discharger to seek de-designation of beneficial uses while continuing to operate under a time schedule. De-designation of beneficial uses is needed to avoid the discharge being subject to inappropriate water quality objectives. Based on water quality collected to date, the groundwater directly beneath the McKittrick facility probably meets this case. Because the threat to groundwater quality is limited, General Order 3 does not have very extensive, does not have near as extensive monitoring requirements as General Order No. 2.

The diagram on the left is for General Order No. 2. When the discharge of wastewater is of poor quality but the underlying groundwater is of good quality, depicted by the blue aquifer at the bottom of the diagram. This depicts a condition that could occur if the facility were located over the aquifer to the northeast of the McKittrick facility. Because water quality may be impacted by a discharge, Order No. 2 requires much more extensive monitoring including groundwater monitoring.

So now we'll go to the situation staff believes we are in, which is a hybrid of what we originally intended for Order No. 2 and Order No. 3. This is displayed in this diagram. This is where the underlying groundwater is of poor quality and probably could meet the requirements for Order No. 3, directly beneath the discharge, but there is connection to better quality groundwater and the volume of percolated water is sufficient to cause it to impair better quality of water that may not be suitable for de-designation. Staff believes this depicts the condition of the McKittrick site because we are not aware of a barrier to prevent the interaction of this poor quality wastewater impacts to the poor quality water and the better quality groundwater that we believe is present to the northeast. Therefore, we do not believe that it is appropriate to put the facility under Order No. 3. However, we have concerns with placing them under Order No. 2 also as well due to the need to evaluate background conditions. If they cannot comply with Order No. 2 or Order No. 3, then an individual order is the only option available for continued operation. I should note that the Monitoring and Reporting Program that was signed yesterday is generally consistent with the monitoring and reporting requirements of Order No. 2.



Longley: Let me ask you a question. So if it comes to it, the situation where we do have discharge moving down gradient, would that Order require mitigation measures to alleviate the movement of that discharge material down gradient?

Rodgers: I'll let, Patrick looks like he would like to respond to that.

Pulupa: Yeah, yes I would. The extent of what would be required would be fairly site specific. What General Order 2 talks about, and frankly what would be required under CV SALTS as an anti-degradation analysis of what could be done at the site, and what needs to be done to be protective of good quality aquifer. General Order 2 doesn't really lay out the blueprint because it regulates such a wide variety of facilities so it's really something that would have to be proposed by the discharger based on the existing data and the data that we'd collect under the MRP.

Longley: Now, just to look at other options. If this Board were to go to a cease and desist order, that cease and desist would not mean, to my understanding, that they would stop operating. It would mean that they would have to stop the movement of that discharge. So, if I am correct, then this would be another Order would be equivalent to that, is that correct?

Pulupa: There's a wide variety of orders that the Board could issue. We could issue individual waste discharge requirements that would have time schedule elements built into it and those time schedule requirements could range from long-time schedules or short-time schedules that would force the discharger to stop discharging. Really it's at the discretion of the Board, as long as at the end of the day, at the end of the time schedule, you have protection of the beneficial uses where those uses need to be protected.

Longley: Yes. I guess my concern is right now it doesn't appear that we have the information to be able to make that decision and that is why we are looking at the study to be able to develop the data that we need to make an informed decision, is that correct?

Pulupa: That is absolutely correct. I think Clay's actual efforts were to get a fairly aggressive monitoring and reporting program out there last year. We've had extensive discussions with Valley Water that really intensified over the last couple of months. Valley Water understands why we are asking for the extensive monitoring that's in the MRP that was issued yesterday. So, what we are looking for is that additional information, in particular information pertaining to where the front of that line of impacts are. Clay's unit will be looking at that as the data come in and we'll be evaluating the options on how to regulate this facility.

Longley: Thank you very much. Mr. Rodgers?

Rodgers: Dr. Longley and Board members, that is the end of my portion of the presentation. Patrick Pulupa will make the conclusions and recommendations at the end of the presentation. But I'm going to turn it over to Dale Harvey to talk about of late revisions and changes to the document.

Pulupa: Great, before we go further, Dr. Marcum.

Marcum: I was just wondering, are you also working to get a handle on how fast the plume is moving? You want to know where the leading head is, but I'm worried about how fast...

Rodgers: That certainly is an issue. That changes by gradient because we calculate groundwater flow using Darcy's equation, if you're familiar with that, and the gradient is one of the significant portions of that. It also takes into effect the hydraulic conductivity. Unfortunately, this aquifer is not very homogeneous or isotropic, and so we end up that potential different parts of the aquifer could also have potentially significantly different flow rates within it and so the concern is what's the fastest flow rates. And those are some of the issues that we need to try and resolve is, how fast is it moving?

Longley: Thank you. Mr. Harvey?

Harvey: Chair Longley, members of the Board, again my name is Dale Harvey, supervising engineer out of this office, and I have taken the oath. I'm going to provide a brief overview of the more salient comments we received from the different parties and discuss in general terms what the updated resolution and proposed response to comments, which was also updated yesterday, how we changed those, what the major changes were. There are also hard copies that I believe Kiran's already distributed to you. So, as shown on the slide, we received 3 comment letters from Valley Water Management Company, a comment letter from the Center for Biological Diversity and a comment letter from Clean Water Action.

Valley Water's main comments are presented on this slide, and in short, they disagree with our work staff's interpretation of the available data and characterization of the groundwater quality impacts resulting from discharges from this facility. With respect to the proposed resolution before you, I think Valley Water's biggest concern or biggest comment is that it should be given time to participate in a long-term solution with other sources of salinity within the valley, i.e. CV SALTS. It's our belief that the Monitoring and Reporting Program that was issued yesterday will give us the technical information that we need to come to some better resolution with Valley Water and their consultants. The updated resolution before you now notes that the Board can consider compliance options including those being developed through CV SALTS, and any kind of regulatory mechanism that we bring before you going forward.

The Center for Biological Diversity's comment letter states that the Valley Water discharges are contaminating groundwater and that this Board should immediately require cessation of the discharge through a cease and desist order. Obviously, we don't have a cease and desist order in front of you today, so that's not an option and again, we believe that the Monitoring and Reporting Program which requires Valley Water to fully characterize both its discharge, and to access the groundwater plume migrating from its facility, that data will help us and form future decisions.

Clean Water Actions' comments were similar to Valley Water's, they differed with Clean Water Actions supports adoption of the resolution as long as it results in a cease and desist order that requires Valley Water to cease its discharge.

Pulupa: Just to clarify, I think Clean Water Actions is similar to Center for Biological Diversity.



Harvey: Oh, I'm sorry, Center for Biological Diversity... what did I say?

Pulupa: I think you said Valley Water.

Harvey: Okay, yeah. Got that, tripped up a little bit. As mentioned in the previous slide, we've issued this Monitoring and Reporting Program and that will assist us in bringing to the Board appropriate regulatory measures.

And so now changes to the resolution. Most of the changes to the resolution were editorial in nature, changes in tone, primarily. We did add Finding 11 at the request of Valley Water, and that finding notes the groundwater directly beneath the facility is of poor quality and may be suitable for de-designation of the Municipal and Domestic's Applied Beneficial Use consistent with the State's Sources of Drinking Water Policy. As I already mentioned, we also changed the "therefore it be resolved" paragraph to note the compliance options considered by the Board may include those being developed through the CV SALTS process.

We also made several mostly editorial changes to the response to comments to improve clarity and readability, and also to highlight that Valley Water's discharges are now under a monitoring and reporting program that is pretty much the same as the one that's in your agenda packages minus the informational findings. That pretty much concludes staff's presentation and we're available to answer questions and my understanding is I don't need to enter anything into the record for this kind of appearing.

Longley: Thank you. Are there questions?

Ramirez: No, but I have a comment to Clay, it's Carmen over here. I want to thank you for looking, taking swift action last year. I know that it didn't get maybe the response, or the effect didn't go into effect right away, but I'm glad that you saw the alarm here, because it certainly felt alarming when I was reading it in Atwater. So, thank you and I think it's fair that I at least indicate my inclinations so that when Valley Water comes up they have the chance to address my concerns. So, thank you.

Harvey: Thank you.

Longley: Thank you. Any further questions? Thank you very much. We are now ready for testimony from Valley Water.

Melissa Thorne: Good morning Board members and staff from the Regional Board, (garbled). My name is Melissa Thorne from Downey Brand, representing Valley Water Management Company today. We have two broken up presentations, mine is more background and legal, and we have a technical presentation as well. So we really appreciate working with staff and getting the Monitoring and Reporting Program adopted yesterday. It took a little time but I think we came up with a good product.

Just some of the background, that Valley Water has been discharging at this site since the 1950s. We've had 3 different waste discharge requirements in 1958, 1961 and 1969. The current resolution is a 1969 resolution, so there's been 60 years of activity at McKittrick and the WDR permits predated the Basin Plan for Tulare Lake, which was adopted in 1974. So, I think you

already saw the location, we weren't sure whether you'd have that map that Clay did a good job of giving you that location. So just to give you some background on the resolution as it exists, that it recognized and authorized the use of evaporation and percolation ponds for these waters, but recognized in the findings that these wastewaters are roughly comparable to sea water in quality and not suitable for beneficial use. So, there was an understanding when you percolate water into the ground that what's underneath is going to be pretty much the same because there was no groundwater out here at that time. The WDRs also recognize that usable groundwater in the area was confined to certain areas, Little Santa Maria Valley and other small alluviated valleys in the Belgian Anticline Oil Field south of McKittrick and the area generally east of Buena Vista Slough some 7 miles northeast of the disposal zones. So the 1969 WDR did not prescribe or contain specific monitoring requirements, but Valley Water has been voluntarily monitoring on a semi-annual basis of both produced water and in the ponds and groundwater since 2002. And as you saw, we've been turning in monitoring or recording reports regularly with information on where the water is. We also complied with the Regional Board's 13267 Order and provided additional data requested. And, as you heard, we accepted a Monitoring and Reporting Program to continue regular reporting and monitoring.

So, what other things has Valley Water been doing? We've explored water treatment and we did two pilot projects on produced water from our Fee 34 facility. It wasn't water from McKittrick, but it's similar quality. And so, we have two different contractors that did multi-stage treatment, and we were able to get the produce water to meet discharge standards including for salts and boron, but the technologies are not currently cost effective. So, that's the problem.

The other problem is with these technologies, you create a brine that is even more concentrated, and right now we don't have a place to put it. So, Valley has also been participating in CV-SALTS since 2015, and is an executive committee member and is a member of the Central Valley Salinity Coalition. And, we've been working on things like exceptions in management zones and regulatory flexibility for salinity, and we added boron to the mix because we knew that was another issue that we were going to have and we needed some flexibility. We're hoping that those kinds of things can be used once they are adopted at your next Board meeting hopefully.

So a new permit, we're not opposed to a new permit. We understand the current permit is outdated from 1969. We thought we could fall under General Order No. 3, because we thought that the water underneath the facility meets the criteria as of 1989 to be excepted from designation as MUN. And, we understand that you want additional monitoring for groundwater that is not in the General Order No. 3. And, we've accepted this MRP that includes groundwater monitoring, where General Order No. 3 did not.

We think that a new permit can be better tailored once the Basin Plan amendments are adopted per CV-SALTS, and once the monitoring data is in under the new MRP. So, we're asking you for an MUN exception under this facility, and I've given the language from the resolution in 1989, that this Board adopted under the Sources of Drinking Water Policy.

The State adopted the Sources of Drinking Water Policy and then every region adopted their own policies into their Basin Plans. So this resolution designated waters that, at that time in 1989, had no designated beneficial use designation for MUN and designated those waters with the



exception of surface and groundwaters where TDS exceeded 3,000mg per liter, or 5,000  $\mu$ S per centimeter of electrical conductivity, and it's not reasonably expected by the Regional Board to supply a public water system. Or, where there is contamination by either natural causes or human activity unrelated to a specific pollution incident that cannot reasonably be treated for domestic use, either using best management practices or best economically achievable treatment practices.

We think the exceptions criteria were met in the 3,000 TDS, as you saw the TDS levels for the produced waters are very high. They've been at those levels since the 60s, so by the time 1989 came around and this resolution came around, the water underneath the facility was above 3,000 TDS. We think that those criteria were met, although we don't have actual data from the 1980s.

The designated uses drive the requirements of the things that have to be protected are based on the uses. There's never been an existing MUN use of the water of percolated under McKittrick, and we are willing to work with other entities that are looking for an MUN designation so we can bring up a group of them together. I liken this to the recent de-designation that this Board did for ag ditches. The ag ditches do discharge and that water gets to MUN waters. So, for example, an ag ditch that hooks into the Sacramento River, the Sacramento River is MUN, but those ag ditches are not. And I liken this to the same thing even though it's underground, that our water is not MUN water, it may move towards an MUN water, but that doesn't mean our water is MUN water.

So that is all of my part of the presentation. I want to thank Board staff again for working with us and getting through the issues that we needed to get through on the Monitoring and Reporting Program. We are committed to working with staff to monitor and to protect the down gradient uses of water. Are there any questions on my piece of the puzzle?

Longley: Any questions?

Ramirez: No, but it shows that, you know Valley Water has been participating for a while and has some foresight in the work that's it been doing with monitoring. I appreciate that you've been working with staff, but I'll wait for the rest of the presentation.

Thorne: Okay, thank you.

Longley: Thank you for participation in CV-SALTS. The issue, of course is moot, but that's why we'll be going through the report. You mentioned the issue with very concentrated salts and your problems there; the City of El Paso is one good example where they have actually gone to marketing salts. They were deep well injecting, there were some issues with that that they are moving away from, and through doing that, they are marketing water. They clean it up to the point where they do market the water, but they also are marketing salts. And, they end up with little bit different direction than typically we go there. They were not looking for zero liquid discharge, that's what they ended up with.

Department of Energy is just, it has \$20 million a year for the next 3 years to put into their labs to develop a de-sal hub and they are looking at these kinds of issues because they are not unique, they are found elsewhere. And, not just in oil production, but also in other facilities, food processing and so forth, and I think it's important that we begin to find some answers and there

will be. The Department of Energy certainly will be looking for partnerships down the road to be able to address some of these issues from what I learned.

Thorne: We would love to get involved in that and we're waiting for this Board to finish the food safety panel so we can get clarity that we can use this water for food safety. We've also met with the Governor's office. There is a lot of produced water, it's a lot of water, and it's wet water. And, if it can be treated economically, it can be used for all kinds of purposes. Twenty years ago, we went through this issue with recycled water and people did not want to use recycled water because the "yuck factor" and "toilet to tap" and everything, but that's wet water and now people can't get enough of it. And in fact, people are suing because the cities in LA are not recycling enough water. So the environmental community has come full circle on that, and we're hoping that we can get there with oil field produced water too.

Longley: Thank you very much.

[cross-talk]

Dan Tormey: Okay, my name is Dr. Dan Tormey, I work with Catalyst Environmental Solutions, and we are working with Valley Water on this issue, and I have taken the oath.

One, I just would like to add a little bit to that final discussion that Chairman Longley and Melissa Thorne were having about the potential future use of this water. I do a lot of work in Australia where they are approaching the same issues. You know they are a dry country, they have a big agricultural sector, they have a growing oil and gas sector, and they are trying to do the things that we are trying to do here in the Central Valley which is find a place where this water that comes associated with the oil and gas can be used beneficially. And, you know, it's a process, it's not going to happen overnight. The agreements are going to take a long time, the technology has to become much more cost effective, but it's moving in that direction. And your citing of the El Paso example is a good U.S. one as well.

So, I've been working on these ponds with Valley since about the middle of last year. I came in to look at the totality of the data that's in place now, and to work to develop a groundwater model. Both to look at the past flows that have come up a couple times in the earlier presentations, and then to use the model to predict in the future what the flows and the extent of this plume would be.

And, you know, as a result of working on that model, you know, a model the ultimate goal is to be a predictive tool. But, to get there you have to have agreement on the data that is going in. And so, models have a predictive value, but they also have a value in groups working together to agree on what the data is saying, because that's what's going in the model. And that's exactly what's happened during this process as well. This is just a list of the meetings we've had with Board staff since the middle to the end of last year. To present the initial results of the model, and then to work through those areas both in agreement, which there is many, and to very much focus on those where there is still some uncertainty that we need to address in order to have a model that we can all get behind, and that we feel adequately represents the setting. This is the map that you're probably getting used to now. Let's see here. I don't really see my arrow coming in. Okay. So, perfect. Thank you. There we go, okay.



So, this shows the three wells of the Valley Water facility that are known as the Sentinel wells. So these wells went in in 2005, and they were dry until about 2014. And so, that places a bound on the degree of movement from here to here. So, in terms of flow, in roughly 50- or 60-years, the plume advanced almost a mile. The initial results of the model, now these do not reflect complete agreement with Board staff, but the initial results of the model suggest that over another 30 years of operation as now, you would have approximately three-quarters of a mile movement, so roughly, closer to the Clean Harbors facility there. So those are the initial results. But, you know, flow did come up a few times in the earlier discussions, so I wanted to give what perspective I could on that.

So, this is our Sentinel wells at Valley Water. The plume is within that zone there. The overall mass of the water, which you can calculate based on the data we have, roughly corresponds to the amount that was put in. And, since the only water there is the water from those percolation ponds, those two should match. And they approximately do. The first water you see here, at the Clean Harbors facility, is up in this northwest corner. And, I think it's fairly said that the areas of disagreement between Board staff and Valley center in this place where there is no data. And, because of the work we've done in trying to have a consensus set at input data to our model, it really helped in coming to agreement on the Monitoring and Reporting Program as well. So, that it will be focused to answer the questions that we have for this area.

I just want to, assistant Executive Officer Rodgers did a really good presentation, the amount of data, rough trends. I just want to bring up a couple of points that from the Valley Water perspective indicate the picture that - I had with that map earlier - that the plume has just reached the Sentinel wells and does not extend down to Clean Harbors. This is showing two stratigraphic sections. This part depicts the area beneath Valley Water. And, the first water that you see here ponding producing this plume is down here. And, over under Clean Harbors, there is also water within this, it's called the Intermediate Zone or the Upper Tulare Sand, which is what Assistant Executive Officer Rodgers was saying. What I really want to point here though is that, there you go, right here, beneath Clean Harbors, above that clay unit known as the CCE, you do have water beneath Clean Harbors - you do not beneath Valley.

This is a consensus view of both Board staff and Valley Water. In fact, Board staff pointed this out to us. And, we are unaware of a physical mechanism whereby you can have water migrating in a deeper zone from Valley Water, and then it goes up through a clay and starts ponding beneath Clean Harbors. This is one of the puzzles.

Longley: Dr. Tormey, I think you make an interesting argument. I do think however, one of the purposes of the study is to, and we knew this area is, the geology in this area is highly irregular. I think, I would expect that the study would be in resolving some of the, it would have to resolve some of these differences between staff and Valley Water, as to the fate of the water which is coming out of the Valley Water facility. This is an interesting argument, but you know I have to take this with some doubt, given the variant, the differences in geology that occur in this area.

Tormey: Chairman Longley, you are exactly correct that the Monitoring and Reporting Program is intended to answer these very questions. My intent with this slide, and there's two following that are similar in nature, is just to present, a very brief view, Valley's view, of the

data. But I'm not intending to say, this is what it is. I'm intending to say, this is what it looks like now. Board staff has different views on some of these topics, that is the intent of the MRP.

Longley: Thank you.

Tormey: Okay, on this next one, this is one of the Sentinel wells. And it first had water, these are plots of water level over time, this one first had water starting towards the end of 2014. If you go down to the bottom, this is the middle zone underneath Clean Harbors, that had water going back to prior to 2010. So, again, sort of a paradox if the view is the water beneath Clean Harbors comes from Valley. Now again, this is another depiction of this gap, that the Sentinel wells were dry until 2015, and yet in Clean Harbors you did have water. Another view, this is just looking at TDS, this is the last of these particular slides, but the total dissolved solids, basically the salinity. And, the upper wells here are the Valley Water wells, the lower ones here are those beneath Clean Harbors with the exception of this one, 121D, or 21D1 that is a Valley Water well. But other than that, these are Clean Harbors.

Longley: Your slide is cut-off on the bottom, what are range of dates on this?

Tormey: Okay, that starts in 2002 and goes to 2012. Oh no, I'm sorry, 2018. Sorry about that.

Longley: Thank you.

Tormey: Sort of cut-off on my view too. Then the vertical line here shows when the Sentinel wells first had water. And, if you go down here, when the Sentinel wells were dry, the TDS in the Clean Harbors' wells was already going up. And again, these are issues that will be resolved, but this is a question that the MRP needs to answer, how could that salinity be increasing if the water is still back beneath Valley?

So, just brief summary where we stand, I think there's a lot of areas of agreement. We focus down to areas of disagreement, they are pretty much what I just showed you, and the MRP is the path forward to resolve those. And then, I don't want to spend a lot of time with the model. I mostly just want to show you these slides regarding the model to demonstrate that we haven't just been going back and forth on data. We and Board staff are working together to create a tool that reflects our shared understanding of the data once we get there, and will allow us to much more quantitatively answer the questions that you will be posing as you face decisions further on down the line. So, the objective is predict that maximum extent of the plume that can be expected. It will have to answer various questions. You know, if the plume is going to stop moving at some point, what are the processes that are going to cause that? What will cause it to stop? Where will that maximum extent be relative to areas of groundwater that may be usable? And then, over what timeframes are we talking about here? So these are main questions.

In terms of setting up the model, we have a lot of data where those wells are. We have very good data. Where there's no wells, we have two different ideas of what's under there. And again, the MRP is the method to fill those gaps.

It's a part of the MRP to put in wells, we will select them jointly with Board staff, and they're very much geared towards giving a good answer at the end of the day. And then Valley has been



collecting data since 2002, and that gives us a long stretch of data in hand now before the MRP even begins. And those allowed us to set up the model, and then the continuation will allow us to validate it better. And then this is my last slide, just kind of where we stand on the modeling effort. We've presented initial results, that's provoked a lot of very positive discussion. And as far as the stratigraphy goes, and the complexity, I think we are fairly close on agreement there, with the exception of that gap area where we have no data, and we're working together I think is the main message.

So if you have any questions, I'd be happy to answer them.

Longley: Any questions?

Ramirez: I have a question, could you go back three slides please?

Tormey: Sure.

Ramirez: That one.

Tormey: Okay.

Ramirez: So, I like this first question, kind of, except for the word "liked." So, I'd like to feel comfort that that water flow will eventually, will be impeded, it will not keep going. So, what is the foundation for that assumption?

Tormey: So, there is a process that impedes the flow of water as it percolates down. So, if you think of say, watering your lawn, and you get some percolation down into there, it doesn't go 100 feet down, it goes down as far as the amount of water that you put on it pushes it down, and no further. The little pores, it's like 30% open space between sands and soils, things like that, those little pores restrict water going through. You've got to kind of push them through. So, that's, that's, we call it the "head" is that volume of water that is pushing it down. So, at the Valley Water McKittrick facility, you have the ponds give you more or less a continuous pushing downwards and that's why the water has gone all the way down to the water table. And that, that head is continuing. And so, that's pushing the plume out where it's going now. But, the resisting force to that is the open space of the clays and the sands that resist flow. So what we're already seeing is that, at least from the model, is that that resisting flow is causing some of the water to backup, because it can't all go downstream. That already those resisting forces are acting. Once the pond ceases accepting water, then you should, you're at the end, the continuing driving force, and then you can predict—using the model—how much further it's going to flow until it comes into equilibrium with that mound back here and the downward edge. So, what happens is once you turn off the flow at the ponds, that mound will start going down and then it's going to reach a point where it stops going down...

Ramirez: Right, because the head pressure won't be there anymore.

Tormey: Exactly. And then as it's going down, the extent is going to accommodate that, and then it's going to say, no, I'm not taking that anymore and then that's when you've got your match. And so, that's the goal of the model, is to use what we know about the physical processes that impede flow to predict the maximum extent.

Ramirez: Okay, so I think that I, what, the part that I had missed, was that there will eventually not be any flow on the mounds on the top.

Tormey: Correct.

Ramirez: So that's the part that I missed. I didn't, now as seeing that as part of the equation, I understand the question.

Tormey: Yes. And, if you were to just keep putting water there on top forever, you would still have a point where that plume cannot grow anymore. And, what happens then is the pond overflows, it stops taking water.

Ramirez: Assuming that there is no intrusion down past the clay, past anywhere else.

Tormey: Correct. And what does happen, because the water is so salty, and it's got high hardness, it's like the pipes in your house build up with scale that, you know, you pretty much have to replace the pipes after a while because something is plugging, that occurs in the subsurface as well. Those porous spaces start to get little calcium carbonate build-up on them, and that does the same thing, it impedes flow, but it essentially plugs up the ability of that zone to accept more water, and that would cause the ponds to overflow.

Ramirez: Okay, thank you.

Longley: But, that argument follows basic physical concepts very well, still, is based somewhat in a, in the context of homogeneous system, and this one is not homogeneous by any stretch of the imagination. And, that's going to be what we're interested in, in the outcome of this study is just to describe the system better from a geological standpoint.

Tormey: Yes. And that's definitely one of the goals. We've got a good idea of the degree of heterogeneity based on the wells we have now. But, because of the discussions we've had in setting up this model, it's come out that Board staff has suggested that there might be various preferred channels of flow, things like that. And, you can't argue about that, the only thing you can do is to put in some more data points, and if you find them or not.

Longley: Thank you, any further questions? Yes, Dan, go ahead.

Marcum: Well, I see a situation here where we continually add salts to the ponds, and the salts have to go somewhere. And, as regulators, we have to take a look at where they're going, and the threat they are to the environment and other pools of water. I'd like to see more discussion about the regulated brine line, because I think that eventually the salts need to be removed from the valley. Have you looked at, if there was a publicly-funded regulated brine line, you know, would that work? For Valley to concentrate the salts and get them shipped out? If economically and still not break you as a business?

Tormey: My particular... [cross-talk]

Pulupa: If, if I could, I think when Valley Water wants to make the comment that they are participating in CV-SALTS, that's a lot of what their participation will be looking at over next



10 to 15 years. They've contributed financially and are continuing to contribute expertise into the design and execution of the P&O Study, which as of this point, hasn't defined who could or who could not participate in that based on, you know, what level of funding are available, what the projects are for where the salt needs to go throughout the valley, the extent of that brine line, how it will be filled, all of those are still very much unknown. But, so, I mean, we're here today certainly dealing with a piece of that, but the long-term study has, has really yet to get started in full.

Longley: Any further questions or comments? Thank you very much. I have a card from Tom Franz. Dr. Franz?

Tom Franz: Yes, good morning, thank you. I am a Kern County farmer, but, I'm here speaking for myself, and the Association of Irrigated Residents, and Clean Water Action. I'm authorized to speak for them.

Longley: Thank you. And you've taken the Oath?

Franz: I took the Oath.

Longley: Yes. Thank you.

Franz: So, I've been aware of these ponds since the early 2000s, actually a little before, because we were quite concerned about the Clean Harbors facility, and as you went out to look at that you'd see the steam coming off these ponds. And, my father was also a partner with a group of farmers that farmed the land that's most impacted, back in the 70s already. But, there's a different person that took over at this time. So, in 2005, because I'm concerned about air quality and water quality, and things like that, for future generations...

Longley: Mr. Franz, just one moment, could you take down the slide from the last presentation please. I want to get the slide off the screen.

Franz: Yeah, that's fine.

Longley: Thank you very much.

Franz: I should have brought my pictures I took in the early 2000s of these ponds for you. But, in 2005, a person working in the oil fields, and I know lots of people living in Kern County that do that, so if you're concerned about anything in these oil fields, you should be concerned about those being called the McKittrick ponds, but he pointed out those very ponds. He says, because before 2005, it must have started in 2002 according to what I just heard, they, Valley Water mapped out the extent of that plume. They had their own private, I don't know if they gave it to the Regional Water Board at that time, but they knew the extent of that plume very well in 2005. And, the person I talked to said, that's what you should be concerned about. That is, you know, outrageous, that all, that toxic water has moved so far already. So I was concerned, and I did take people out to see those ponds. And in 2014, some of the staff and Regional and State Water Board people came out to see those ponds. I was with them on that day. And that got the ball rolling to reach the point that you are today, 4 years later, considering doing something about it finally. I don't know why it takes so long. But, we have a serious

problem there. You know enough right now, to in my opinion and the opinion of others, that you need to ask staff to prepare a cease and desist order. That water has moved so far, that it's not going to stop. They can stop putting water in the ponds right now, and that water keeps moving for another 50 years, another mile or two. The Clean Harbors facility, you didn't mention it, but they've dug pits. I was involved in the permitting of that. Their pits are 150 feet deep on that site. And, they at the time had perched water about 10 feet lower than that. I don't know where it's at today. But, just imagine this wastewater inundating an area of those pits right now filled with hazardous waste. It's not a pretty site. And, the California aqueduct is right below that. I don't know what it means for a plume of water to start moving under the California aqueduct, but you know, who knows? But, we've got to look at the future, six generations more. I'm part of a six generation family living on the same piece of land right now in Kern County. There's, anyway. I like to think six more generations, another 150 years, part of my family is going to be living there and farming, right? And, why not? But the things we do today show up much later, like the 123TCP and so on. And, I'm just saying cease and desist now, because you know the problems there. It's serious. Remediation, meaning probably pumping some of that water back up and putting it back in the ground where it came from, because that's ultimately where most of that water needs to go. That needs to start today, that process. Thank you.

Ramirez: Thank you.

Longley: Thank you Mr. Franz. Any questions for Mr. Franz? Thank you. I'll take a closing statement by Valley Water at this time.

Thorne: We don't have one.

Longley: You don't have one. I'll take a closing statement by, before we go any farther let me do a double check. Are there any other interested persons in the room that wish to speak? Thank you. I'll take closing statement by staff.

Pulupa: So, we've gone through a long process with Valley Water. And, I think the Board has gone through a long process with how we have been regulating oil fields. The General Order says they were issued. We were sure to find situations that didn't quite fit in one General Order or another. I think the fact that we have issued a Monitoring and Reporting Program that trends towards, and very significantly, towards the type of monitoring that we will be requiring of the facility that impacts the high quality aquifer. Even though Valley Water is situated directly above an aquifer that we wouldn't ordinarily consider a high quality aquifer, is a huge step in the right direction. So we're going to get the information that we need to make additional decisions with respect to this facility.

I think the overall philosophy of the State Board and the Regional Boards is we want the right discharges to be happening in the right places. We have a lot of oil fields in our Region. And, we want to make sure that if they are causing impacts, that they are not causing impacts to aquifers, that we need to protect, that are a source of ag water, that are our source of drinking water. We want to confine all those impacts to aquifers that are already unusable because of natural conditions, because of historic operations, consistent with the Source of Drinking Water Policy. I would say that, with respect to Valley Water's comments, Melissa's comments, about the MUN de-designation process that was just approved by this Board—and will be going before



the State Board soon—I think that is a model that we do want to look to, to a certain extent. And, if, as you recall, what we did there was say, look, we won't regulate the MUN beneficial use in those water bodies, those ag drains that were never intended to be used as an MUN supply, provided that we have the appropriate monitoring in place to make sure that those water bodies that are downstream, and that do have an MUN use, are fully protected and that we know that we're not causing impacts to the those downstream water bodies.

So, I think that the situation is fairly analogous here. With respect to Mr. Franz comments, I totally hear where you're coming from. I think we are going to put Valley Water, regardless of whether it's a General Order or an individual Order, on a path to compliance. I think that we ordinarily want to give dischargers the opportunity to explore options that will ensure that there will be six more generations and beyond that, being able to farm that land, being able to live on that land. I think that involves to certain degree an exploration of the opportunities that are out there for treating that water; for putting that water to productive use on the ag lands. I think we've heard that analogy to recycled water that "toilet to tap" has now become showers to flowers" and everybody wants to use it. I think there are significant opportunities with respect to this water to doing the same thing, to get ag lands irrigated with this water, provided that we can continue to explore treatment. I do think that we want to make sure that if there are impacts from this facility, that they are confined to portions of the aquifer that are not usable, that we would ordinarily not want to protect consistent with the Source of Drinking Water Policy. I think the MRP heads in a very good direction. And, I think what staff are looking for to hear from this Board today, frankly, is whether you believe that it is appropriate to continue to try and regulate this facility, perhaps under an individual Order that imposes requirements that are really a hybrid between those requirements of General Order 3 and General Order 2 to continue to protect that downstream model.

Longley: And are you ready to give a recommendation for the Executive Officer?

Pulupa: My recommendation is that the Board adopt the resolution as proposed. I think the conversation that I've heard from the Board is to lean heavily towards the direction of an individual Order. If I could hear comments from the Board on that issue, I think that would really help staff out.

Longley: Thank you. My comments are going to be simply, [coughing] a Board member, the most important member who was, the Board member who was involved in consultation with the staff on this Order. And, the MRP I think is a very robust MRP. The chemicals that are being looked at are chemicals of great concern, if they are there. And, they will, may not be there, but that's what the whole purpose of this exercise is, and it's a very important exercise. The Board, we've heard from members of public that they think that a cease and desist order should be placed upon this facility. That could be one possible outcome depending upon the results of the data that comes out of this study. It is my hope that, certainly, that we will find that the data supports, and that's a very important statement, what the data supports. That we can allow this facility to continue to operate with certain measures that will protect groundwater, both groundwater quality and the movement of groundwater. But, that study is really the key to that, because when Boards make decisions that are not based upon good data, they typically end up in court, and are reversed. We need data to be able to make good decisions, and that's what

we're asking for here as part of this Order. With that, with that, I will be voting to adopt the resolution.

Ramirez: I have a question for staff, the study as far as collecting data, how long of a time period are we looking at?

Pulupa: So, what the MRP is asking for, and probably most significant to the topics that were discussed today, is installation of additional monitoring wells. There will be a monitoring well installation work plan due I believe within 90 days, is that correct, Clay? Or Dale? 60 days. Within in, after the issuance of the MRP which was yesterday, so very quickly they will be... go ahead. Clay had some more background, but that monitoring well installation work plan, and the monitoring of the new wells, should be able to give us a lot of that information. They will be doing regular sampling of those wells to inform and further development of the model and understanding of the geology beneath that facility.

Rodgers: And, I just want to add, since access has been such an issue, I think I've finally got arranged a meeting for the 19th of this month, to meet with Valley Water, Chevron representatives, Clean Harbors representatives all at the same place at the same time, to see if we can come to resolution and find some locations for the wells.

Longley: Clay, don't go away.

Pulupa: And, I just know what Clay is mentioning is, I think he said it on one of his very early slides, that area right there is potential endangered species habitat. So, it is not the easiest to access, and you have to make sure that when you do access it to put a well in, that you do it with all due sensitivity for any special status species or habitat out there.

Longley: Now if this discharge were into a surface water, access is infinitely much easier, however the stream is going to move with a velocity that is much, much greater than we see in ground water. Typically what would you expect annual movements of a contaminant to be in this, in this particular geology setting that we have here?

Rodgers: That's a really interesting question, because part of the question has become is that when you do that Darcy's Equation, you deal with issues of gradient, hydraulic conductivity, and what's called the effective porosity of the sediments. The hydraulic conduct, the gradient we can measure, we can measure the elevations and water between the wells, and we know what that slope is...

Longley: So typically, what would you expect?

Rodgers: I can tell you I've seen groundwater velocities in coarse grain materials over 1,000, you know, more than 1,000 feet per year, multi-thousand feet per year. We do, in some of the boring logs out here, they find gravels. These are stream deposits. They tend to be relatively coarse separated by some extensive clays that may represent ancestral lake bed deposits. But, when you hit those coarse grain zones, and Dr. Tormey you mentioned it a little bit, there's a process called sequence stratigraphy, that talks about that, anisotropy of the sentiments and how you'll get the different flows. But it could be, it could be up to 1,000s of feet per year, with a gradient that's, you know, looks like we could be talking about, you know, I forget the exact



number, but between the ponds and where the water is measured there, you know, you're talking about hundreds of feet per mile.

Longley: So, what we are seeing though, currently, would indicate that that's not the case. This is...

Rodgers: We have significant technical issues with some of the parameters in the model and the assumptions used to calculate that. I can tell you that, you know, the statement was made that the well was dry until 2014, and that location had no water. That assumes that the water level was previously at the bottom of the well. I can also tell you, supposedly, reportedly, they went out every 6 months, and measured the elevations in those wells, although we have no field notes for the few years prior to that. The first time they measured water in one of those wells that had 50 feet of water in it, that's a significant amount of water to accumulate in a 6-month period. So, we have some questions about exactly where the water was, and did it really hit there in 2014, or does the timing start to move back?

Longley: And, other compounding factors of course, we were in the midst of the drought at that point and time. What is the source of the water? **There may be other sources, and we don't know that.**

Rodgers: I think it's very clear that it's oil field produced water based on its chemical signature, and also its oxygen hydrogen isotope information, which is being used extensively at this site to help identify produced water. The issue may be is, there are other nearby facilities.

Longley: That's my point.

Rodgers: There's not really a source of water other than the oil field waters, but there are other sources of ponds, rather than just this one which brings some question into modeling. When you say, the water that's there can only come from this facility, because if it's got other contributors to that, there's actually more water there than the model accounts for.

Longley: Well, that's something we have to attempt to resolve I would think in the modeling itself.

Rodgers: Yes it is, And, it's a question because part of the reason for the resolution is, we have some other nearby facilities that, that we need to, you know, we've been waiting for this action to happen and direction for how we address those facilities and issues that were associated with the Monitoring and Reporting Program, because we probably need similar monitoring and reporting requirements on them to collect the same information, so we can start to help answer some of those questions.

Longley: Thank you, any further questions?

Marcum: Yeah, I've got one for Clay.

Longley: Clay don't go yet.

Marcum: Does an individual discharge order in this case, it allows you to go more swiftly to get the information you want, and then also, does it set a precedent for other individual discharge orders for other dischargers with similar situations. Are we starting to see them?

Rodgers: The precedent situation I'll let Patrick Palupa respond to that one. As far as moving quickly, we've known for a while that we have some issues. We've been looking at this site for a while, even before we went on the tour that Mr. Franz mentioned. You know, we've been trying to take a methodical, logical approach for how we do this, so that we don't take the wrong steps, and our results are based upon the data. But, once we had the General Orders adopted a year ago, we started asking questions. We said, you know, we have to do something a little bit different with this, it's not clear, let's get modern monitoring and reporting requirements on them. Even though, when I will give Valley Water some credit, that they had done voluntary monitoring, but I also firmly believe that had they not done the voluntary monitoring, we would have taken steps even more quickly. You know, in order to collect this additional data, it's unfortunate, in fairness to Valley Water, you know some of the endangered species have prevented us from moving as quickly as perhaps we could have. And, that's part of the reason why I said we're just going to get the parties together, and see if we can, you know, it will include some biologists also, to see how we get this done, because we need to find a way.

Pulupa: And, I could address a little bit of those questions as well, with respect, back to his, an MRP precedential? It's not strictly precedential, in the sense that we have to follow that path with other similarly situated dischargers. We still do a case-by-case analysis, unless we put something in the Basin Plan, then it's truly guides our future actions in a more stringent way. But I will say, when we have issued an Order, and when it's getting the information back to us that works, it's a high bar for a discharger to come in and say, we don't want to do that. We can push back and say, we know what works. If you've got another way that works, we'll consider it. But, if we've got something that's working real well, that can be the model for future MRPs.

With respect to whether getting an individual order gets us the information, like waste discharge requirements gets us the information quicker, these MRPs, and really they're more like technical orders under 13267, really do get us the information that we need on their own. And, they are stand-alone enforceable Orders. So, if this Board sees, and what I'm getting from the tone of the Board's questioning here, if we see any foot dragging with respect to getting a monitoring and reporting program up, if we see any foot dragging with respect to getting those wells installed, that isn't very well-justified, this Board could very well see an enforcement action of that stand-alone Monitoring and Reporting Order in front of it in fairly quick order. And, I think also with respect to what the Board does, based on how quickly that water is traveling through that water table, what I'm hearing from the Board right now is, the Board should gear it's actions based off of how that threat is expanding. So, if the water and the issues are moving very slowly, I think that gives us a little more time. If they are moving very quickly, I think the staff, from what I'm hearing, should be informed that they should be developing the orders as expeditiously as possible.

Longley: This one Board member would concur with that. I'd like to add though that, as we go down the road, if we need additional data from other dischargers, and as Mr. Rodgers indicated there could be other ponds contributing to this issue, I think we have to move rapidly to get that data too. I don't want to come back here and find that well, we've gotten from the



Valley Water folks, we've gotten as much data as we can get from them, but there's some other data out there that we need. I think that would be remiss. I think we need to get that data ASAP. So with that said, is there any further questions or comments?

Ramirez: Since it seems that, what staff is just looking for is kind of the temperature of the Board. I can tell you that, when I heard this Item, I'm, there's a couple things. First, I'm glad that Valley Water is here and is participating, and is at the table. I think they've done a very good job by getting good people on their side. Certainly, counsel was very instructive, and I appreciate the narrative of the history and the plans and going forward. Certainly, their geologist on board was very helpful. And, I recognize that there are economic considerations for Valley Water, which is normal. And, I think that, you know, as a business owner myself, I don't begrudge a company for having these things enter into the equation. In fact, I think that they are necessary.

However, I know that Valley Water has to recognize that our charge is different as the Water Board. It's our charge to, to the best extent that we can, preserve the quality of water not only for California's today but certainly generations forward, whether it's six generations or ten generations. And that is a very heavy duty that we try to think about. That's why my questions about whether the water can really be contained, and those kinds of things, are really important to me. You know, Clay mentioned that he has meeting on April 19th, and you know, the way that we answer to the people of the state of California, I'm going to ask Clay and I know that he is very astute and takes us into consideration, but you know, this is a very heavy charge. And so, we're looking to you as our representative to make sure that at that meeting the duty that the Board is tasked with is kept at the forefront of your mind. I know that it is, but, I want to make that explicit. I heard the explanation from the geologist, and I think that given the scenario that was discussed, I can see why the assumption was, the assumption could be, that the water could be contained and not necessarily percolated or comingled with the different aquifer. I understand the explanation, I don't know that I'm ready to believe that that's a possible step, or a possible, not possible, a likely immediate finding. So, I mean, I hope that that's true. And then, finally, as far as policy, I'll just say that it's my feeling that the speed of getting this information is very important to me. I think that this is a priority. I want to be sensitive to certainly the business needs, and I know it's going to feel harder high heat. I appreciate the speed within which Valley Water is going to start their analysis of well, well analysis. So I appreciate that speed, but I don't think this is something that we should let up on. So, to the extent that staff wanted to hear the temperature of the Board, I can say that for me, those are my thoughts on the issue.

Longley: Any further comments or questions? Dan go ahead.

Kadara: No, it's...

Longley: or yourself.

Kadara: Yes, I do agree with what I heard Board member Ramirez speak on. And, I'm more inclined to, you know, the issue of a cease and desist has come up several times, and I know we have legal issues in dealing with that. And, our main focus is to create that opportunity for the monitoring and the data that we need to give us information to make some concrete decisions. And, I'm agreeing with you that it's important that we have this done expeditiously,

because it's, we don't want to delay it, and we don't want to create any further problems. So, if we have that understanding that that's how we're going to be moving forward, I will more than likely be able to support the decision and our staff's recommendations. But, the concern is moving things along quickly.

Longley: Thank you very much. Any further comments? If not then, yes, I'm sorry.

Pam Creedon: [garbled] So, Dr. Longley, we appreciate the comments received on the urgency and need for implementing the MRP that was signed yesterday. But, the resolution does have some recommendations on which direct they would like to get a little temperature for the Board on which direction in terms of General Order 3, which is the, which was the proposal by the discharger, or by staff, where we believe 2 or an individual order is more appropriate. I think what I'm hearing, because of this uniqueness to this site, that possibly an individual order is where the Board's leaning towards right now. I'd like some kind of validation or comments around that please.

Ramirez: Certainly, that's, I should have included that. I think that given the uniqueness of what we're facing, and the unique situation about the possible de-designation of beneficial uses, the fact that you've got other qualities, certainly the gradient there and the slope, all these things make me think that, **this is a situation where an individual order is best**. I recognize that that means a lot of work for staff, but given the importance of this, I would feel that that's the way that I'd like to see it go.

Longley: I have to concur with Board member Ramirez. I think my earlier comments were pointing towards an individual order. Any further comments? You have to excuse me leaning backwards and forwards, we're all lined up in a row here and I'm trying to see down the line if people are responding.

Ramirez: And then I've got the fluffy hair going on, so I'm blocking...

Longley: Thank you very much. Okay, seeing no one else wanting to speak at this point, I'll close the hearing and confine the discussion to the deliberation and voting. We've pretty well expressed our thoughts, are there any further discussion? Go ahead Dan.

Marcum: I'm still stuck between the MRP and the General Order dilemma. It seems to me that staff's moving along swiftly, and if the MRP works and we get a response, I'd be satisfied. If they are slow and staff's not comfortable with them, I would go to a General Order.

Pulupa: So the MRP is just a reporting order, it does not regulate...

Longley: And that was signed yesterday by the Executive Officer.

Pulupa: So, we still need a set of waste discharge to regulate the discharge from the facility. That's what the direction would be.

Marcum: So what are you telling me? General Order?

Longley: It would be either a General Order or an individual waste discharge permit.



Creedon: Member Marcum, these are two different, separate issues, we've been talking a lot about the MRP that was signed and issued by a delegated authority from the Board to the Executive Officer, that happened yesterday. What we're asking about with the resolution, trying to move forward into regulating this site. The MRP is a form of regulation, but it's not the order that's over the entire site. So, right now we're looking for some feedback from the Board on what's the best mechanism to move forward with the regulation. And, that's either with one of the three General Orders or an individual order, which then when the Board adopts either through the General Order or an individual order, we'll wrap the monitoring program into that overarching. It's very, they're all orders, it's confusing.

Longley: Thank you, any further comments.

Kadara: So, the question is, should we, Board member Ramirez spoke about the individual order, so did the Chair, but, how are we going to make a decision on that versus the General Order? Can you give us a little more feedback, one versus the other, as far as addressing.

Pulupa: So, because the order actually isn't in front of the Board, the general direction that we've been hearing from the Board, would lend us to say, we're going to need a report of waste discharge from the discharger to get an individual set of waste discharge requirements out there. And, to see if it doesn't fit under either the General Orders, we need an individual order.

Creedon: Could we bring back up staff's presentation and those slides that give a character or tune of the different orders?

Rodgers: Just a moment.

Ramirez: And I think, Ms. Kadara, I think that we understand that the study is going to give us a lot of information that's needed, so I think...

Creedon: The MRP was signed, will be that bridge that will give us, continue the discharger to move forward gathering the data, so that it will inform the development of the future order.

Ramirez: I think that's why it lends itself to making an individual order.

Kadara: That's what I needed to hear, thanks.

Creedon: So on this...

Rodgers: Ms. Creedon is this the slide you.

Creedon: And keep this, and the next slide. So, you adopted you three General Orders or one action for three orders last year. Excuse me. And, General Order 3 is where we have, I'm sorry [coughing] poor quality waste water. But, we also have an aquifer where the quality is such that beneficial uses aren't supported. And so, therefore they are eligible for de-designation. The reason why that's being (garbled), we have in our Basin Plan a General Application, a blanket application of the Sources of Drinking Water Policy that the State Board adopted many years ago, where our aquifers, many of our aquifers and surface waters were automatically designated as a drinking water source, without any action by the Regional Board. The Regional

Board had to add to de-designate that use, which it never happened, until part of the CV SALTS effort was about to identify those water bodies that should be de-designate from that general blanket application. So, what we said under, the dischargers' been focused on General Order 3 because it kind of fit that definition. If you looked only in the immediate area of the discharge, overlying very poor quality water, it can't be used for drinking water, it can't be used for ag, and their discharge is of poor quality. That's General Order 3, it assumes worst case scenarios for both waters, and it doesn't have a lot of monitoring requirements.

General Order 2 is where you have a poor quality discharge, but it's overlying good quality water that does support the uses, and so that has a far more stringent requirements and a lot more monitoring.

While we have over Valley Water, which staff was trying to present to you, and we're trying to get the monitoring data to validate this or disprove it, whichever case it falls under, that we have the water body directly underneath the site, poor quality water, but it migrates down into higher quality water. And, that's the situation we have here. We have it in a few other sites as well in the valley. And so, this doesn't lend itself to any particular General Order. And, that's why staff is, if you want the General Order it would be No. 2 at best case, and an individual order which staff tends to believe is the most appropriate approach. But, we wanted to get the temperature from the Board, because the discharger clearly has said they want Order 3. And, we just want to kind of get some feedback from the Board so that we can just move forward without the back and forth of this agreement over how to approach the site.

Longley: Thank you very much. So, if I can summarize what I've heard Board members say that there tends to be a general consensus towards quite possible an individual order, would I be correct in that? Or does a Board member object to that? I see everybody nodding to the affirmative. Does that give you the direction that the Board would be going to?

Pulupa: I believe it does.

Longley: Thank you. Thank you very much. With that then, we will move on to deliberation and voting. We've done the deliberation, so please call the roll.

Kadera: There's been no motion.

Longley: Oh, hey, I need a motion, don't I? Give me a motion.

Ramirez: So, I would move that a Board resolution be determined that an individual order for this situation...

Longley: No, no, no. The title of it is...

Ramirez: There's a title?

Longley: Directing staff to prepare an appropriate order.

Ramirez: So, I would move that we direct staff to direct an appropriate order that reflects the will of the Board which is that an individual order.... I can't do this.



Pulupa: Because we don't have the individual order, I think we've gotten enough feedback that we just adopt a resolution as proposed.

Longley: We direct staff to prepare an appropriate order to comply with waste discharge requirements Resolution No. 69199, Kern County.

Pulupa: That's actually not your revised resolution.

Longley: That's not the revised Resolution. Tell us what the revised resolution is.

Pulupa: The revised resolution is an order directing staff to prepare an appropriate order for Valley Water Management Company's McKittrick 1 and 1-3 facility in Kern County.

Ramirez: I would move to prepare a resolution to reflect the language that attorney Pulupa just recited.

Longley: Do I have a second?

Marcum: I'll second the motion.

Longley: Carmen made the motion, Dan seconded. Call the roll please.

LADY: Ms. Ramirez?

Ramirez: Yes.

LADY: Dr. Marcum?

Marcum: Aye.

LADY: Ms. Brar?

Brar: Yes.

LADY: Ms. Kadara?

Kadara: Yes.

LADY: Dr. Longley?

Longley: Yes.

LADY: Motion carries.

Longley: Thank you. That takes care of what we have in front of us for Board action today. We will recess until....

LADY: Dr. Longley, will the Board entertain doing the uncontested calendar?

Longley: The uncontested calendar is advertised for tomorrow and it doesn't take very long, so... we can do the uncontested calendar tomorrow morning. We will recess until 8:30 tomorrow morning, this room. Thank you. Thank you very much.